WHAT IS CLAIMED IS:

1. A radiation detector, said radiation detector comprising:

a first array comprising a first photon incident surface;

a second array comprising a second photon incident surface; and

a scintillator array extending from said first photon incident surface to said second photon incident surface.

2. A radiation detector in accordance with Claim 1 wherein said first array is offset from said second array by approximately one-half detector pitch normal to an incident x-ray direction.

3. A radiation detector in accordance with Claim 1 wherein said scintillator comprises a plurality of optical fibers.

4. A radiation detector in accordance with Claim 1 wherein said scintillator comprises a sheet of scintillator material.

5. A radiation detector in accordance with Claim 1 wherein said scintillator array is configured to direct at least a portion of a plurality of optical photons to said first photon incident surface and said second photon incident surface.

6. A radiation detector in accordance with Claim 1 wherein said first array and said second array comprises a plurality of sensor elements comprising a plurality of photosensor devices.

7. A radiation detector in accordance with Claim 6 wherein said plurality of photosensor devices are disposed in a linear array pattern, such that each photosensor device in said sensor element is disposed adjacent at least one other photosensor.

8. A radiation detector in accordance with Claim 7 wherein said photosensor devices are aligned along a sensor element axis corresponding to a longitudinal dimension of said sensor element.

9. A radiation detector in accordance with Claim 3 wherein said plurality of optical fibers are oriented orthogonally to a path of a plurality of x-rays passing through a collimator.

10. A radiation detector, said radiation detector comprising:

a first array comprising a first photon incident surface and a plurality of sensor elements having an aperture pitch size;

a second array comprising a second photon incident surface and a plurality of sensor elements having the aperture pitch size, said first array sensor elements offset from said second array sensor elements by approximately one-half the aperture pitch size to facilitate achieving an increased resolution of the sensor elements; and

a scintillator array extending from said first photon incident surface to said second photon incident surface, said scintillator array is configured to direct at least a portion of a plurality of optical photons to said first photon incident surface and said second photon incident surface, said scintillator comprising a fiber optic scintillator having a plurality of optical fibers bundled in an array and disposed such that said x-rays are incident on said fiber optic scintillator substantially perpendicular to a respective optical axis of said plurality of optical fibers, said fiber optic scintillator further being optically coupled to at least two of said sensor elements such that said sensor elements are disposed at both ends of the plurality of optical fibers

11. A method for fabricating a radiation detector, said method comprising:

fabricating a first array including a first photon incident surface;

fabricating a second array including a second photon incident surface; and

positioning a scintillator array between the first array and the second array such that the scintillator extends from the first photon incident surface to the second photon incident surface.

12. A method in accordance with Claim 11 wherein said fabricating a first array and a second array comprises positioning the first array one-half detector pitch offset from the second array normal to an incident x-ray direction.

13. A method in accordance with Claim 11 wherein said positioning a scintillator array comprises positioning a scintillator array including a plurality of optical fibers.

14. A method in accordance with Claim 11 wherein said positioning a scintillator array comprises positioning a scintillator array including a sheet of scintillator material.

15. A method in accordance with Claim 11 wherein said positioning a scintillator array further comprises positioning a scintillator array to direct at least a portion of a plurality of optical photons to said first photon incident surface and said second photon incident surface.

16. A method in accordance with Claim 11 wherein said fabricating a first array and a second array comprises fabricating a first array and a second array including a plurality of photosensor devices.

17. A method in accordance with Claim 16 wherein said fabricating a first array and a second array including a plurality of photosensor devices comprises fabricating a first array and a second array including a plurality of photosensor devices disposed in a linear array pattern, such that each photosensor device in said sensor element is disposed adjacent at least one other photosensor.

18. A method in accordance with Claim 17 wherein said fabricating a first array and a second array including a plurality of photosensor devices comprises fabricating a first array and a second array including a plurality of photosensor devices aligned along a sensor element axis corresponding to a longitudinal dimension of said sensor element.

19. A method in accordance with Claim 13 wherein said positioning a scintillator array including a plurality of optical fibers comprises positioning a scintillator array including a plurality of optical fibers oriented orthogonally to a path of a plurality of x-rays passing through a collimator.

20. A method for fabricating a radiation detector, said method comprising:

fabricating a first array including a first photon incident surface including a plurality of sensor elements including a plurality of photosensor devices;

fabricating a second array including a first photon incident surface including a plurality of sensor elements including a plurality of photosensor devices;

positioning a scintillator array between the first array and the second array such that the scintillator extends from the first photon incident surface to the second photon incident surface, the scintillator array is configured to direct at least a portion of a plurality of optical photons to the first photon incident surface and the second photon incident surface, the scintillator including a fiber optic scintillator including a plurality of optical fibers bundled in an array and disposed such that the x-rays are incident on the fiber optic scintillator substantially perpendicular to a respective optical axis of the plurality of optical fibers, the fiber optic scintillator further being optically coupled to at least two of the sensor elements such that the sensor elements are disposed at both ends of the plurality of optical fibers.

21. A projection radiography imaging system imaging system for generating an image of an object, said imaging system comprising:

a detector array comprising:

a first array comprising a first detector pitch (d); and

a second array comprising a second detector pitch (d) equivalent to said first detector pitch, said second detector offset from said first detector by approximately one-half detector pitch normal to an incident x-ray direction;

one radiation source; and

a computer coupled to said detector array and said radiation source, said computer configured to:

sample said first array and said second array approximately simultaneously,

combine the samples by interleaving the samples together to yield an effective sampling step size of approximately one-half detector pitch; and

reconstruct an image of the object using the interleaved first array samples and the second array samples.

22. A radiography imaging system imaging system in accordance with Claim 21 wherein said detector further comprises a scintillator array extending from said first array to said second array.

23. A radiography imaging system in accordance with Claim 22 wherein said scintillator comprises a plurality of optical fibers.